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Estimated Returns and Costs for Cow ~ Calf and Dairy Farms in Alberta, 1984

By
Dr. Carlyle Ross

Production and Resource Economics Branch
Economic Services Division
Alberta Agriculture

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ESTIMATED RETURNS AND COSTS FOR COW-CALF AND DAIRY FARMS IN ALBERTA, 1984

By

DR. CARLYLE ROSS

Production & Resource Economics Branch
Economics Services Division
Alberta Agriculture

May, 1986

FOREWORD

This report or "witness statement" was prepared at the request of the Canadian Cattlemen's Association (CCA) in support of the CCA countervail case against unrestrained imports of boneless manufacturing beef from the European Economic Community (EEC) during the period 1984 and 1985. The report was submitted to Canadian Import Tribunal, which held hearings in Calgary, Alberta, June 16 - 20, 1986. After final arguments were concluded in Ottawa on July 02, the Tribunal ruled that, whereas injury to the cattle industry was not fully established, further imports of subsidized EEC beef would be harmful to the Canadian cattle industry.

The Production and Resource Economics Branch is responsible for keeping Alberta Agriculture and its farm clients informed on the production costs/returns, productivity and profitability of agricultural commodities produced in the province. This report, prepared by Dr. Carlyle Ross, was not seriously challenged by opposing counsel. The Tribunal accepted the report as a factual description of the economic performance of cow-calf and dairy farms in 1984. Dr. Carlyle Ross appeared as an expert witness at the Calgary hearings of the Tribunal.

M. A. CAMERON, Director
Economics Services Division

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INTRODUCTION

The Production and Resource Economics Branch (PREB) of Alberta Agriculture is responsible for providing the department and its field staff, farm clients, other government departments and agribusiness with current information on farm inputs, input costs, yields, returns and profitability for the crops and livestock produced in Alberta. In keeping with this responsibility, the branch maintains a strong economic research program directed at selected crops and livestock produced in the province. The objective is to provide farmers (and policy makers) with current production and resource economics information to help producers improve the economic efficiency of their individual farms and hence the industry as a whole.

In addition to my responsibility as the Head of PREB, I personally supervise the livestock research program consisting mainly of beef, hogs, poultry and sheep. The current cow-calf study is under my direct supervision, while the dairy cost study is being done by one of my staff, Rudy Susko.

DESCRIPTION OF COW CALF SURVEY

The provincial cow-calf study was initiated in the fall of 1984. The study sample was drawn from a 1981 provincial list of 26,100 cow-calf producers. Producers were randomly selected from that list with due allowance for regional and size differences. Farms reporting fewer than 10 cows were excluded from the sample. (Only farms reporting 10 or more cows were included in the provincial list.)

Producers selected in the sample were first contacted by telephone to explain the purpose of the survey and to solicit participation. A follow-up letter was then mailed to all study participants outlining the purpose of the study. The letter also listed some of the information which the participant was required to assemble in anticipation of a field visit.

A detailed questionnaire was prepared and pretested prior to the survey. The information requested included some personal characteristics of the farmer, feed use and costs, labour use and costs, fixed assets, operating expenses, production, sales/receipts, financial summary, and some aspects of the beef cow herd and its management.

Two hundred and sixty-five producers were interviewed on their farms. The completed questionnaires were processed in Edmonton and each part-icipant was sent a detailed analysis of his cow-calf operation. Part-icipants were asked to review their results, particularly those items which were questioned in a letter enclosed with the results. Participants were given several weeks to review the results, after which time, producers who had not responded were contacted by telephone. When all of the individual results were validated, the group analysis was finalized. Two hundred and thirty-nine questionnaires were used in the group analysis.

RESULTS OF COW-CALF SURVEY

Cow-calf farms are not completely homogeneous. Four production systems can be identified based on sale dates and weights of market cattle. They are the "pure" cow-calf, cow-yearling, cow-feeder and cow-finish production systems. The pure cow-calf enterprises sell the majority or all of their calves after they are weaned in the fall.

Thirty-one per cent of the sample could be categorized as pure cow-calf, 44 per cent cow-yearling, 21 per cent cow-feeder, and 4 per cent cow-finish. The results which follow are based on the pure cow-calf farms, henceforth referred to simply as cow-calf. These farms, 75 in number, marketed the majority of their calves in the fall of 1984.

The typical producer on the study reported wintering 193 cows and heifers all of which were exposed to service in 1983. The corresponding calving rate, defined as live calves born in 1984 to these 193 cows, was 91.84 per cent. Taking into account calf losses from all causes, the calf-crop in 1984 was 88.48 per cent.

The estimated market value of assets associated with the cow-calf operation was $935,023 per farm or $4,838 per cow. The debt to asset ratio was 8 per cent.

Home-grown feed was valued at regional elevator prices and treated as a cash cost. Only actual interest paid on operating and term loans in 1984 was included in the analysis. To the extent that there were arrears on interest payments, the costs reported would be underestimated.

Unpaid operator labour was valued at $6.00 per hour and family labour $3.00 per hour. Almost two-thirds of the labour was supplied by the operator and his family, and the remainder (35%) was hired.

A farm can sustain losses and remain in business provided that the gross income is sufficient to cover all variable or operating costs in the short term. But over time, ie., in the long term, if the business is to be economically viable, gross income must cover all production costs, including a positive return to owner equity.

1984 was a very unprofitable year for cow-calf producers in Alberta. Every dollar of income produced necessitated expenditures of $1.72. Gross income from the sale of culls, calves, slaughter cattle, etc. and the draw-down of the inventory, amounted to $78,979 per farm or $409 per cow (See Table I). Heifer, steer and bull calves accounted for 69.7 per cent of gross income, and culled cows and bulls 19.9 and 2.7 per cent respectively. Revenues from culled cows and bulls averaged $15,692 per farm and $2146 per farm, respectively. With expenses running at $109,899 per farm, plus $15,208.33 for livestock purchases, cow-calf producers experienced losses of $46,128 per farm or $239 per cow. More importantly, gross income was insufficient to cover all of the variable expenses, falling short by $18,966 per farm or $98 per cow. Indeed, even if home-grown feed and unpaid family labour were provided "free", farms would still have shown a loss in 1984 of about $54 per cow or $10,331 per farm.

Table I

SUMMARY OF COW CALF RETURNS AND COSTS, ALBERTA, 1984

			Dollars	
			Per Farm	Per Cow
	INCOME:			
	Cows	29.5 HEAD	15692.21	81.19
	Bulls	2.4 HEAD	2146.33	11.11
	Heifer Calves	67.7 HEAD	28143.48	145.62
	Bull/Steer Calves	67.2 HEAD	26947.09	139.43
	Other e.g.Feeders etc.		21987.71	113.77
	Inventory Change (+/-)		-15937.63	-82.46
	Gross Income		78979.21	408.65
	Less Livestock Purchased	15.8 HEAD	15208.33	78.69
A.	Value of Farm Production		63770.88	329.96
	EXPENSES:			
	Feed Costs - Homegrown		26769.35	138.51
	- Purchased		10154.62	52.54
	Vet. and Breeding		2174.16	11.25
	Pasture Improvements		3014.40	15.60
	Trucking-Feed		852.97	4.41
	Marketing and Trucking Cattle		2318.30	12.00
	Custom Work		469.62	2.43
	Building and Machinery Repair		5814.65	30.09
	Fuel, Oil, Lube		4506.48	23.32
	Utilities		2323.19	12.02
	Miscellaneous Expenses		5271.59	27.28
	Interest Paid - Operating		2643.42	13.68
	Labor	2667.2 HOURS	16394.80	84.84
B.	Total Variable Costs		82736.88	428.10
	Pasture Rental		2766.78	14.32
	Building/Machinery Insurance		1168.17	6.04
	Livestock Insurance		149.31	0.77
	Taxes		1772.36	9.17
	Interest Paid - Term Loans		6331.39	32.76
	Depreciation		14974.25	77.48
C.	Total Fixed Costs		27162.26	140.54
D.	Total Production Cost (B+C)		109899.14	568.64
E.	Net Income (A-D)		-46128.26	-238.68
Return Over Variable Costs			-18966.00	-98.13
Return Over Cash Costs			-22141.50	-114.56
Number of Cows		193		
Investment per Cow		$4838		
Return on Investment		(3.97%)		

RESULTS OF DAIRY SURVEY

There were 3,536 registered dairy producers in Alberta in 1984. Only 40 per cent of these dairymen shipped fluid milk. However, fluid milk production exceeds the provincial demand for fluid milk and the excess is sold as industrial milk. This excess (unutilised) fluid milk accounted for 78 per cent of the total supply of milk processed for industrial uses. In short, fluid milk shippers accounted for over 87 per cent of the milk produced in 1984.

Fifty nine fluid milk producers participated in the annual dairy cost study conducted by PREB. These producers were selected through a stratified random sampling procedure to allow for quota size and regional representation. The description of the survey and its results are fully documented.[1]

Unlike the cow-calf sector, milk production is subject to provincial and federal supply management. Fluid and industrial milk prices are also regulated. Fluid milk prices are set at a level to recover all production costs as established by the dairy cost study. Consequently, fluid milk producers reported net income of $23,613 per farm or $418.08 per cow (Table II). There were 56.5 dairy cows per farm, with an average investment of $4,394 per cow.

Unpublished survey data showed that in 1984, the average dairy farm sold 15 culled cows. They also sold one bull for every 50 culled cows

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[1] R. Susko, Economics of Milk Production in Alberta Vol.44, 1984 (Edmonton: Production and Resource Economics Branch, Alberta Agriculture, April, 1985) Agdex 821-1.

Table II

SUMMARY OF DAIRY RETURNS AND COSTS, ALBERTA, 1984

		Dollars		
	Income:	Total Enterprise	Per Cow	Per Hl. Sold
	Milk Sales	143284.56	2536.92	44.21
	Net Subsidy and Other	2007.88	35.55	0.62
	Net Cattle Sales	10144.95	179.62	3.13
	Net Inventory Increase	1085.94	19.23	0.34
A.	Gross Income	156523.31	2771.32	48.30
	Grain	7602.51	134.61	2.35
	Complete Feed	15809.11	279.91	4.88
	Supplement	2050.39	36.30	0.63
	Salt, Minerals, Vitamins	591.10	10.47	0.18
	Roughage	25279.16	447.58	7.80
	Pasture	1595.00	28.24	0.49
	Processing Costs	289.61	5.13	0.09
	Feed Costs	53216.88	942.23	16.42
	Bedding and Supplies	3866.59	68.46	1.19
	Vet., Medicine and Breeding	3511.29	62.17	1.08
	Energy	6158.98	109.05	1.90
	Bdlg. & Mach. Upkeep	5427.18	96.09	1.67
	Milk Hauling & Promotion	7727.84	128.77	2.24
	Miscellaneous	3506.78	62.09	1.08
	Other Costs	29743.65	526.63	9.18
	Hired Labour	8706.87	154.16	2.69
	Family Labour	20469.11	362.42	6.32
	Labour Costs	29175.98	516.57	9.00
B.	Total Variable Costs	112136.45	1985.43	34.61
	Rent	966.46	17.11	0.30
	Taxes and Insurance	1570.86	27.81	0.48
	Depreciation	11313.35	200.31	3.49
	Interest (Cap. Debt)	6923.08	122.58	2.14
C.	Total Fixed Costs	20773.75	367.81	6.41
D.	Total Production Cost (B+C)	132910.19	2353.24	41.01

Table II Continued

Summary of Dairy Returns and Costs, Alberta, 1984

		Dollars		
	Income:	Total Enterprise	Per Cow	Per Hl. Sold
E.	Net Income (Return to Equity) (A-D)	23613.11	418.08	7.29
	Return Over Variable Costs	44,386.86	785.89	13.69
	Number of Cows	56.5	Sale Price	44.83
	Investment per Cow ($)	4,394.00	Inventory Adjustment	3.47

Source: R. Susko, Economics of Milk Production in Alberta, (Edmonton: Production and Resource Economics Branch, Alberta Agriculture, Vol. 44, 1984) Agdex No. 8821-1, P.25.

marketed. The cows contributed 5.32 per cent to gross income, and bulls 0.15 per cent. The revenue from cows and bulls amounted to $8,561 per farm. This revenue did not include cows slaughtered for home-use.

POTENTIAL IMPACTS OF MARKET PRICE CHANGES

Culled beef cows accounted for 20 per cent of the gross income of cow-calf enterprises in 1984 and bulls almost 3 per cent. If cow prices were $1 to $10 per cwt higher (lower), the gain (loss) per cow would vary between $11.50 and $115.00. Similarly, the gain (loss) per bull would vary from $16.50 to $165.00. Since the average cow-calf farm marketed roughly 30 cows and 2 bulls for slaughter, the gain (loss) per farm in 1984 would have ranged between $345 and $3,450 for the cows, and between $33 and $330 for the bulls. In sum, the total gain (loss) per farm would have been between $378.00 and $3,780.00 (Table III).

Table III

ESTIMATED POTENTIAL PRICE EFFECTS ON REVENUES OF BEEF COW-CALF FARMS IN ALBERTA, 1984

Price Change	Revenue Per Cow	Revenue Per Bull	Revenue Per Farm Cows	Revenue Per Farm Bulls	Revenue Per Farm Total
($/CWT)	($)	($)	($)	($)	($)
1	11.50	16.50	345.00	33.00	378.00
2	23.00	33.00	690.00	66.00	756.00
3	34.50	49.50	1035.00	99.00	1134.00
4	46.00	66.00	1380.00	132.00	1512.00
5	57.50	82.50	1725.00	165.00	1890.00
6	69.00	99.00	2070.00	198.00	2268.00
7	80.50	115.50	2415.00	231.00	2646.00
8	92.00	132.00	2760.00	264.00	3024.00
9	103.50	148.50	3105.00	297.00	3402.00
10	115.00	165.00	3450.00	330.00	3780.00

For dairy farms, the potential gain (loss) per cow ranged between $12.50 and $125.00. Similarly, the potential gain (loss) per bull ranged between $16.50 and $165.00. Since on average, 15 cows and 0.3 bulls were sold per farm, the potential gain (loss) per farm ranged between $192.45 and $1,924.50 (Table IV).

Table IV

ESTIMATED POTENTIAL PRICE EFFECTS ON REVENUES OF DAIRY FARMS IN ALBERTA, 1984

Price Change	Revenue Per Cow	Revenue Per Bull	Revenue Per Farm Cows	Revenue Per Farm Bulls	Revenue Per Farm Total
($/CWT)	($)	($)	($)	($)	($)
1	12.50	16.50	187.50	4.95	192.45
2	25.00	33.00	375.00	9.90	384.90
3	37.50	49.50	562.50	14.85	577.35
4	50.00	66.00	750.00	19.80	769.80
5	62.50	82.50	937.50	24.75	962.25
6	75.00	99.00	1125.00	29.70	1154.70
7	87.50	115.50	1312.50	34.65	1347.15
8	100.00	132.00	1500.00	39.60	1539.60
9	112.50	148.50	1687.50	44.55	1732.05
10	125.00	165.00	1875.00	49.50	1924.50

Alberta Agriculture reported that in 1984, 189,672 cows and 9,253 bulls were marketed at stockyards and shipped directly to packing plants.[1] The report did not indicate what proportion of these animals came from cow-calf or dairy farms. Such statistics are not readily available. However, the unpublished 1984 dairy cost survey data revealed that 27 per cent of the dairy cows in the sample were sold for slaughter. Since there were 157,000 dairy cows on Alberta farms in 1984, it was assumed that 42,390 dairy cows entered the cow-beef market. The dairy cost study also revealed that one bull was culled for every 50 culled cows marketed. Therefore, it was also assumed that roughly 848 culled dairy bulls were marketed in 1984 (Table V).

Table V

ESTIMATED MARKETINGS OF SLAUGHTER COWS AND BULLS
IN ALBERTA, 1984

	Cows	Bulls
	(number)	
Cow-Calf	147,282	8,405
Dairy	42,390	848
Total	189,672	9,253

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[1] Alberta Agriculture, Agriculture Statistics Yearbook, 1984 (Edmonton: Statistics Branch, Alberta Agriculture, 1985) Agdex 853-10.

The estimated gain (loss) to the cow-calf and dairy sectors resulting from the variations in prices of $1 to $10 per cwt. are shown in Table VI. The potential gain (loss) to cow-calf varied between $1,832,426 and $18,324,260, while the potential gain (loss) to dairy ranged between $543,870 and $5,438,700. The potential direct gain (loss) to Alberta ranged between $2,376,296 and $23,762,960 (Table VI).

Table VI

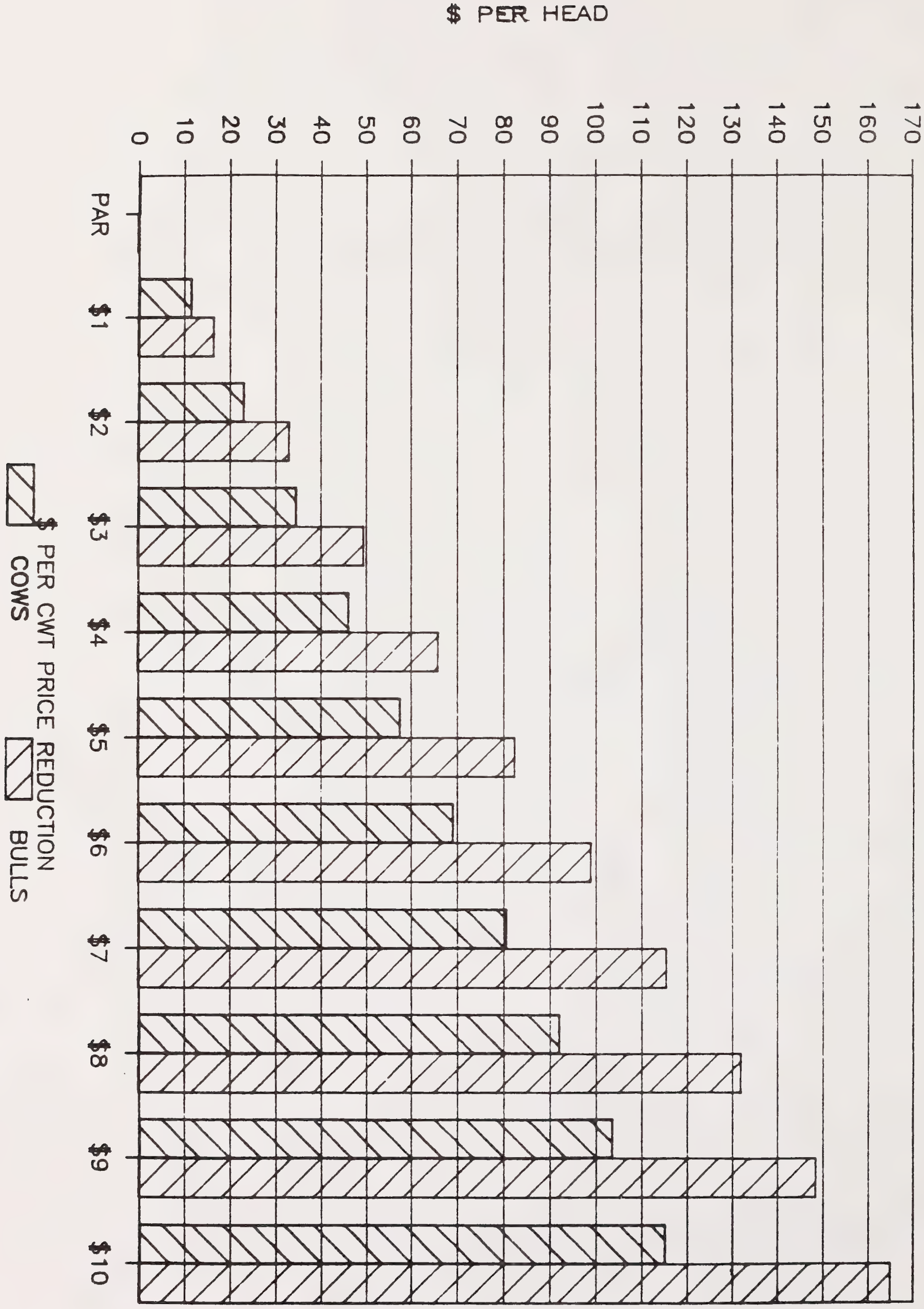
ESTIMATED POTENTIAL PRICE EFFECTS ON
ALBERTA FARM REVENUES, 1984

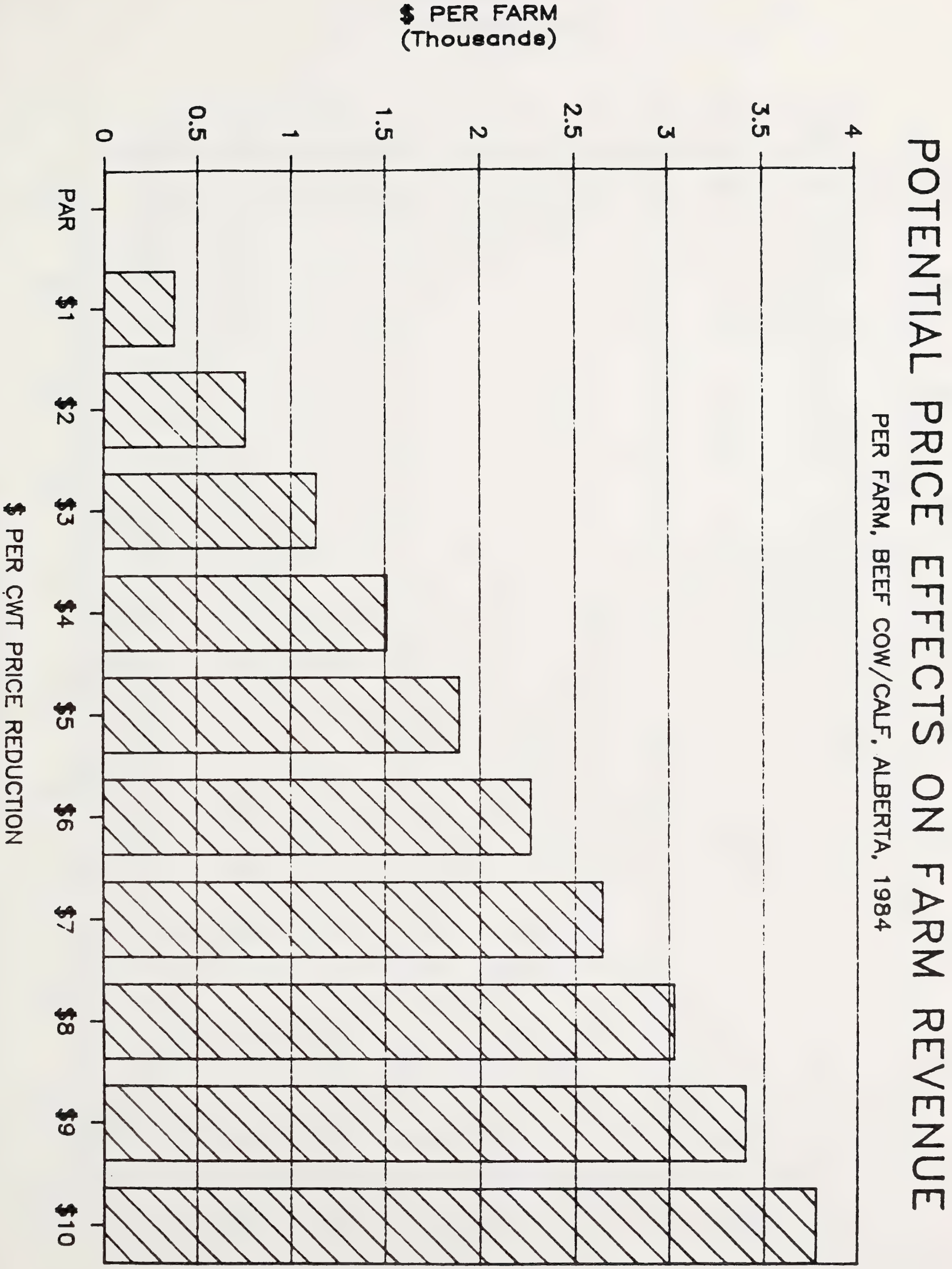
Price Change	Beef Cow-Calf	Dairy	Total
($/CWT)	($)	($)	($)
1	1,832,426	543,867	2,376,293
2	3,664,851	1,087,734	4,752,585
3	5,497,277	1,631,601	7,128,878
4	7,329,702	2,175,468	9,505,170
5	9,162,128	2,719,335	11,881,463
6	10,994,553	3,263,202	14,257,755
7	12,826,979	3,807,069	16,634,048
8	14,659,404	4,350,936	19,010,340
9	16,491,830	4,894,803	21,386,633
10	18,324,255	5,438,670	23,762,925

APPENDIX A

POTENTIAL PRICE EFFECTS ON FARM REVENUE

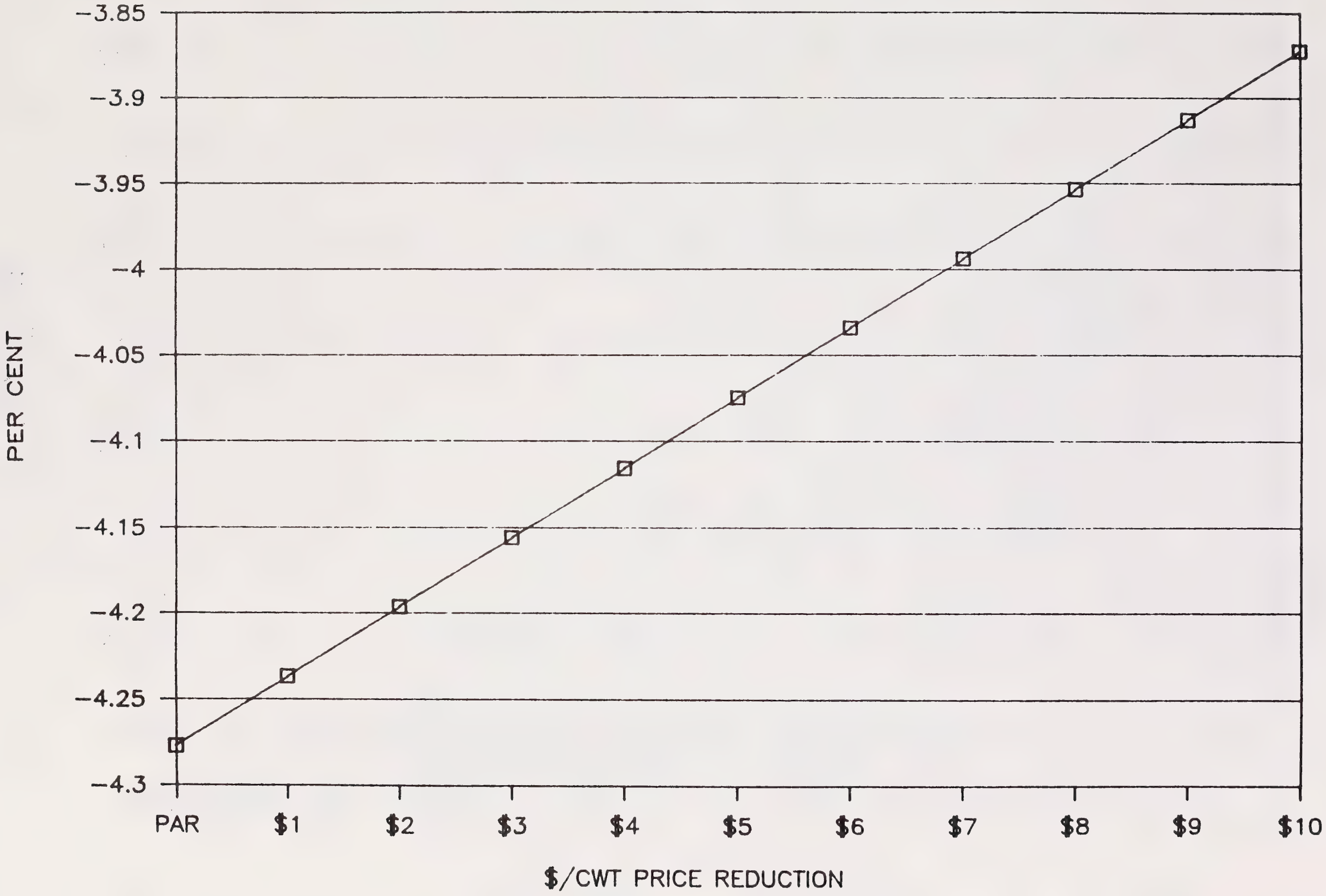
PER BEEF COW–BULL SOLD, ALBERTA, 1984





POTENTIAL PRICE EFFECTS ON FARM REVENUE

PER FARM, BEEF COW/CALF, ALBERTA, 1984

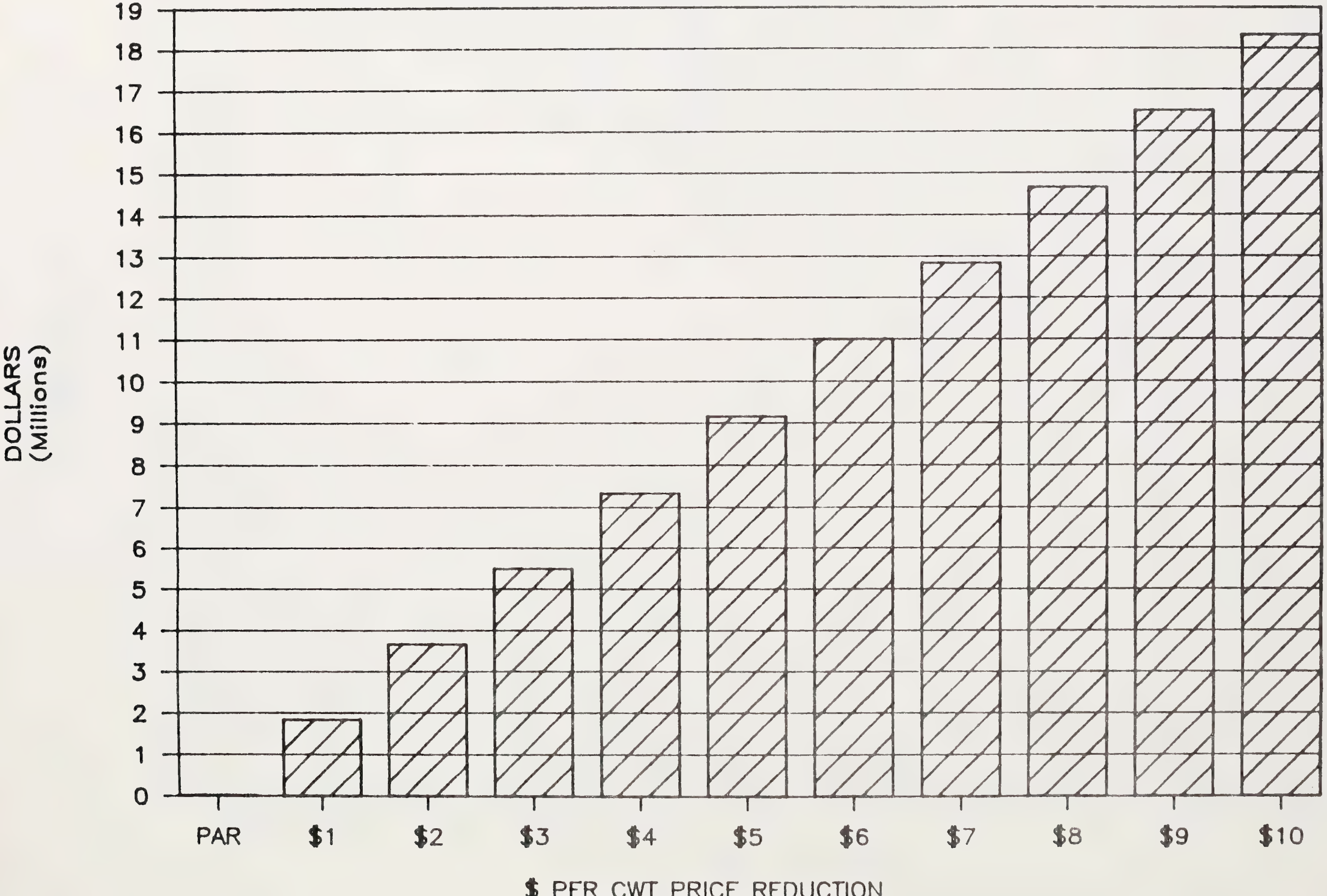


PRICE EFFECTS ON RETURN TO INVESTMENT

PER FARM, BEEF COW/CALF, ALBERTA, 1984

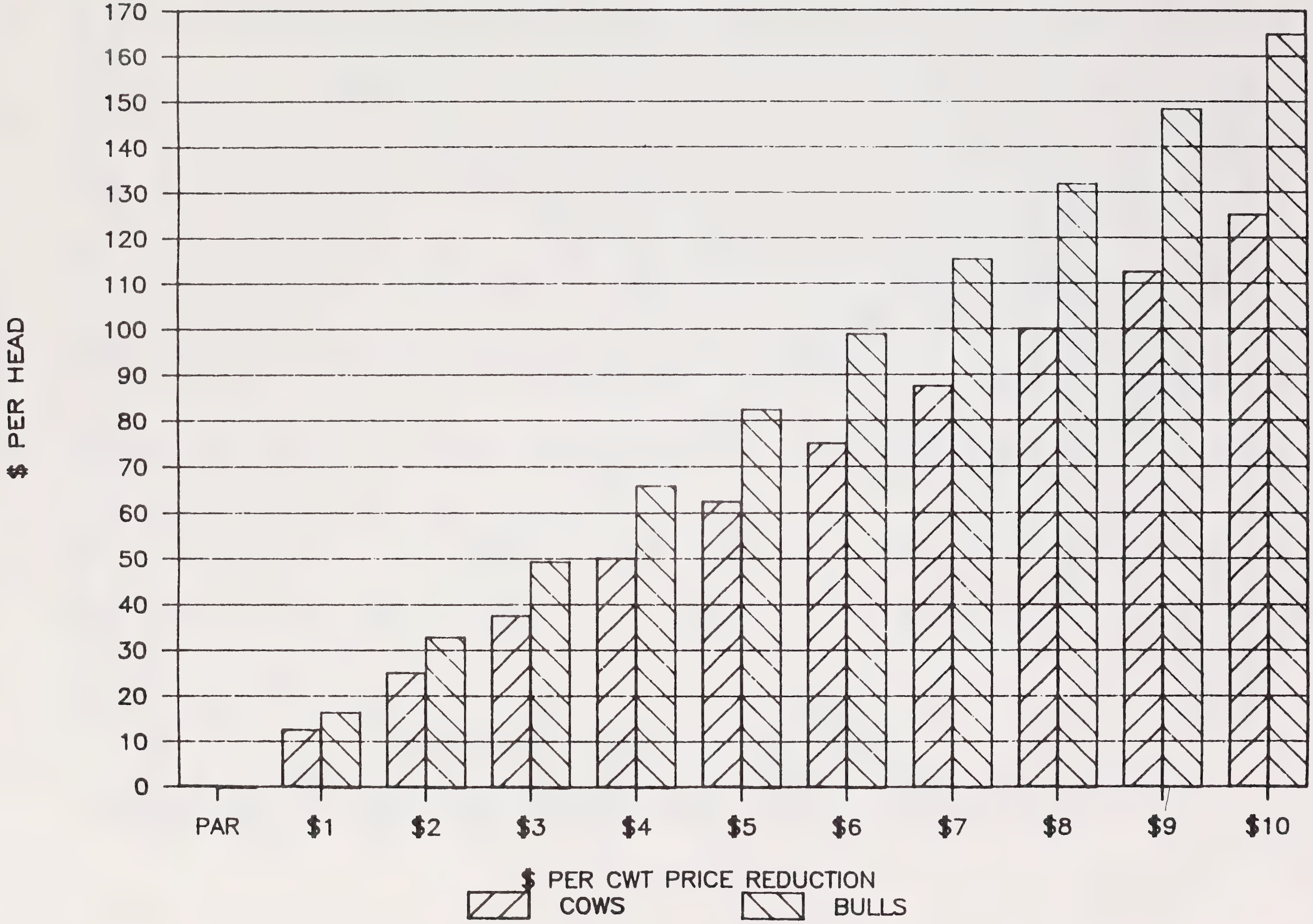
POTENTIAL PRICE EFFECTS ON FARM REVENUE

ALBERTA TOTAL, BEEF COW/CALF, 1984



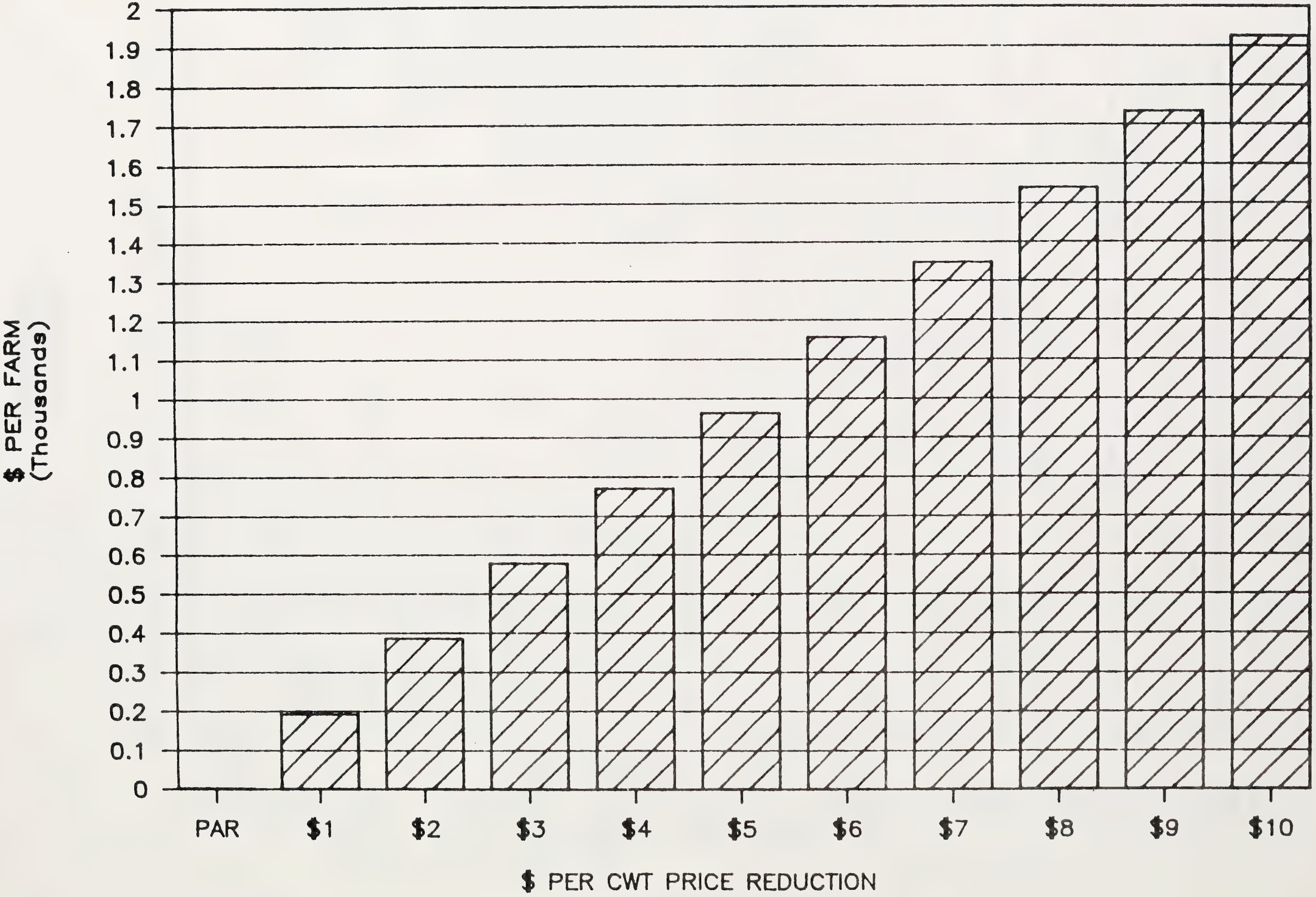
POTENTIAL PRICE EFFECTS ON FARM REVENUE

PER DAIRY COW–BULL SOLD, ALBERTA, 1984



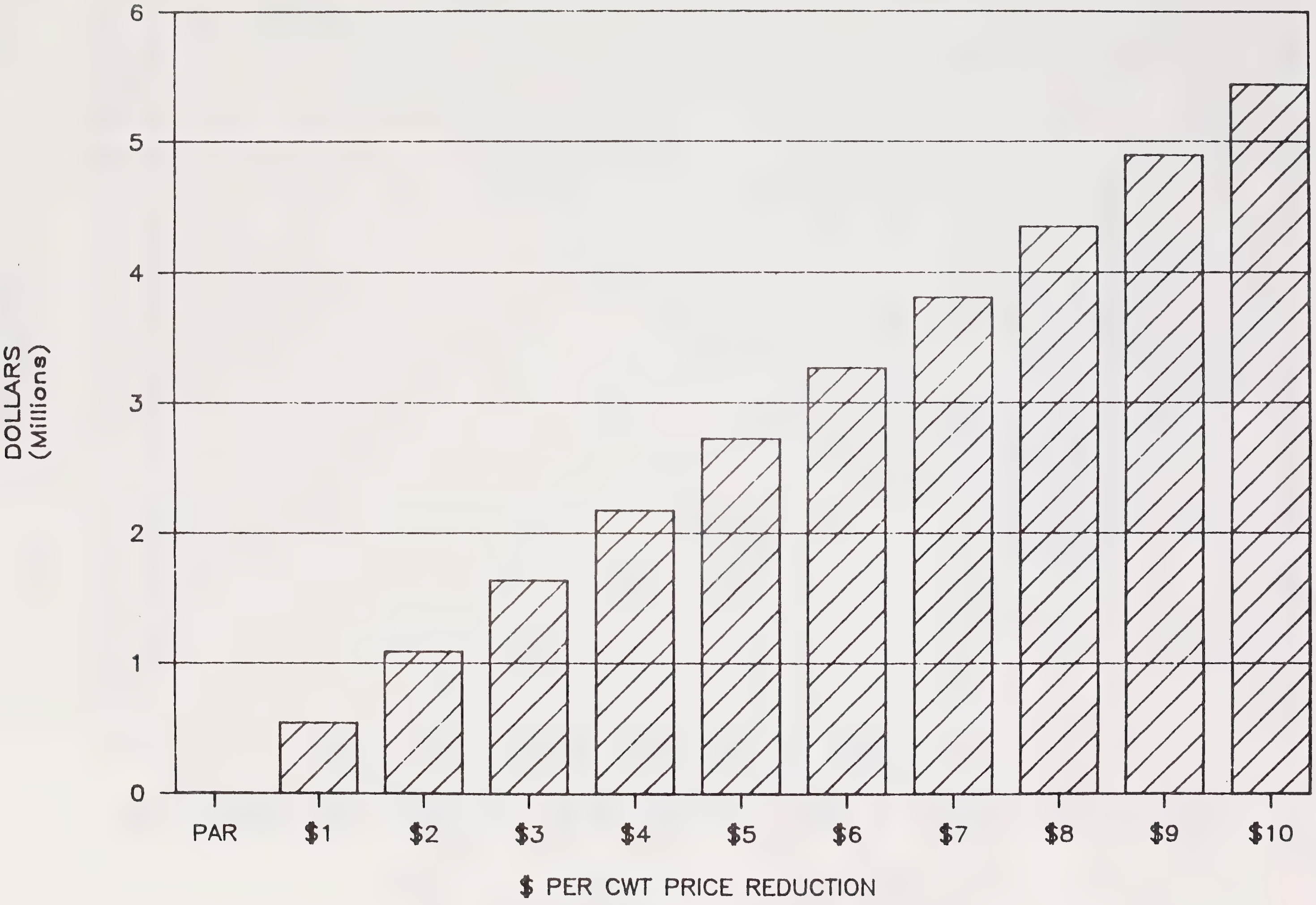
POTENTIAL PRICE EFFECTS ON FARM REVENUE

PER FARM, DAIRY, ALBERTA, 1984



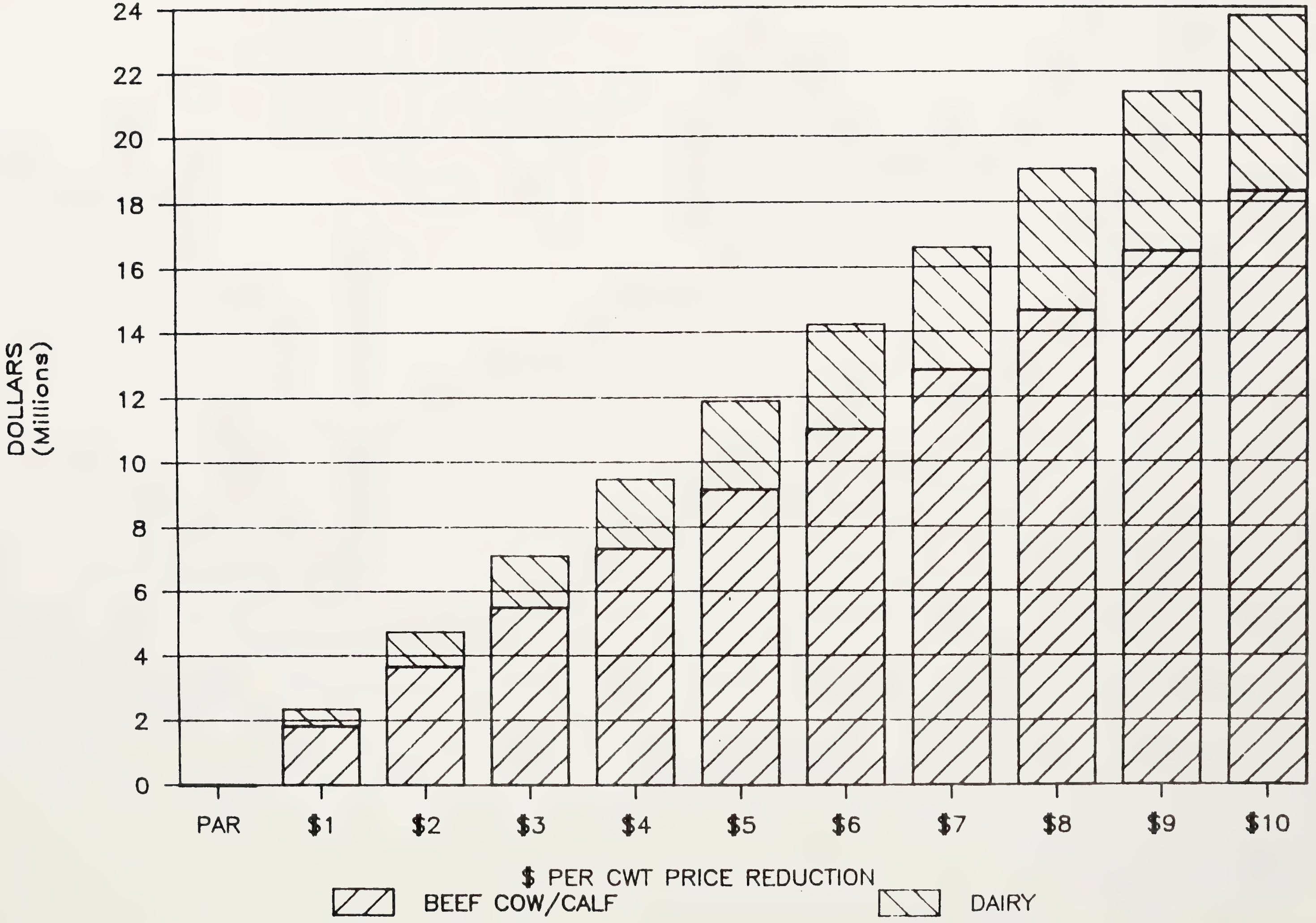
POTENTIAL PRICE EFFECTS ON FARM REVENUE

ALBERTA TOTAL, DAIRY, 1984



POTENTIAL PRICE EFFECTS ON FARM REVENUE

ALBERTA TOTAL, 1984



APPENDIX B

NOT INCLUDED FOR PUBLICATION

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